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(54) Abstract Title

Cassette for use in temporary barrier system

(57) A cassette for location in a hollow post of a temporary barrier system for queue management had top and bottom walls 1,3 connected by strips 9, a central spindle loaded for rotation by a spring, a length of webbing 21 wound around the spindle, and releasable locking means 23 for preventing rotation of the spindle by the spring to enable the cassette to be lowered into the post to bring the webbing into line with an aperture in the post, so that the end of the webbing can be pulled through the aperture and have an end fitting greater than the size of the aperture applied thereto, after which the locking means can be released to allow the spring to exert a retraction force on the webbing. As described the locking means comprises a locking pin 23 fixed to a hexagonal section key inserted into a corresponding aperture in a braking disc attached to the spring loaded spindle. In operation a tool 25 is engaged with an upstanding projection 11 on the cassette to lower it into the post. Once in position, the end fitting is attached to the webbing, the tool is freed from the projection 11, engaged with the locking pin 23 and withdrawn, so removing the locking pin and freeing the spindle for rotation.

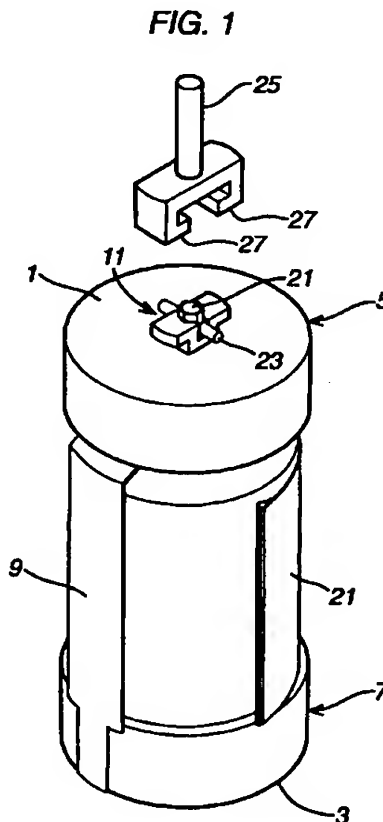


FIG. 1

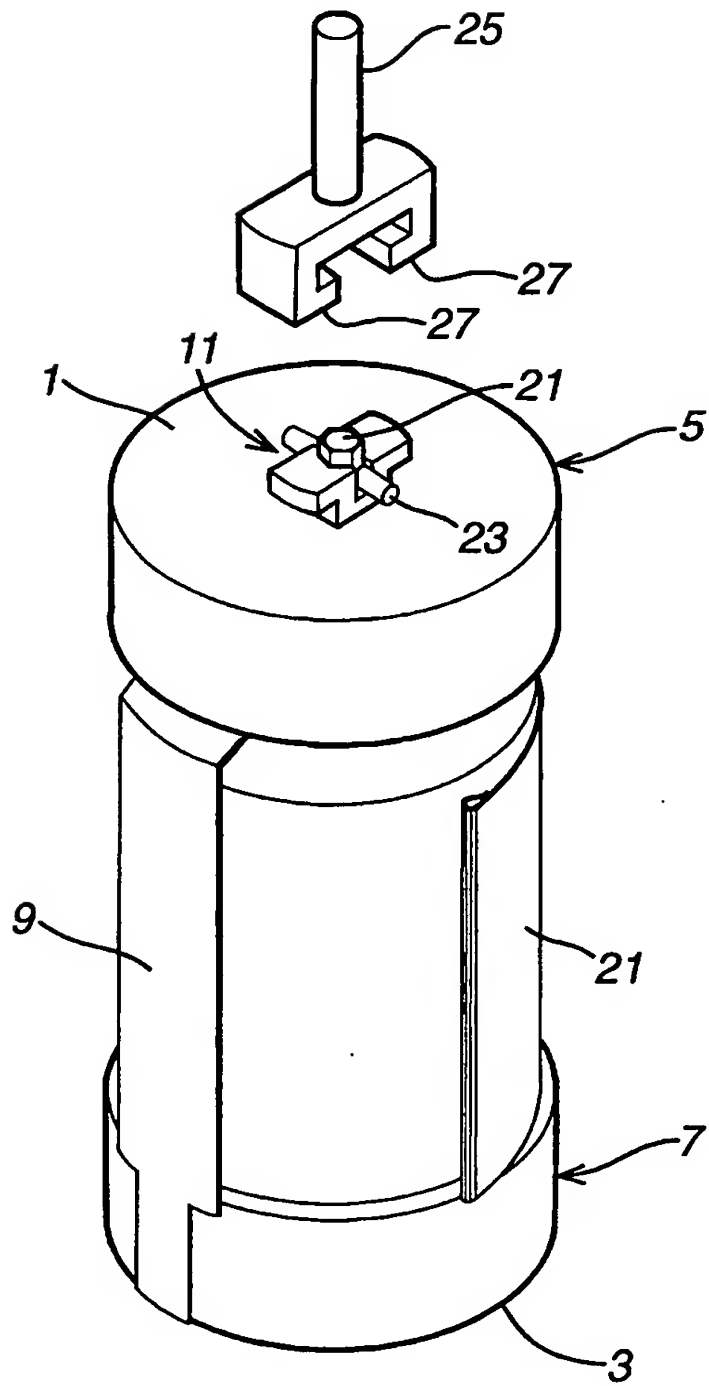


FIG. 2

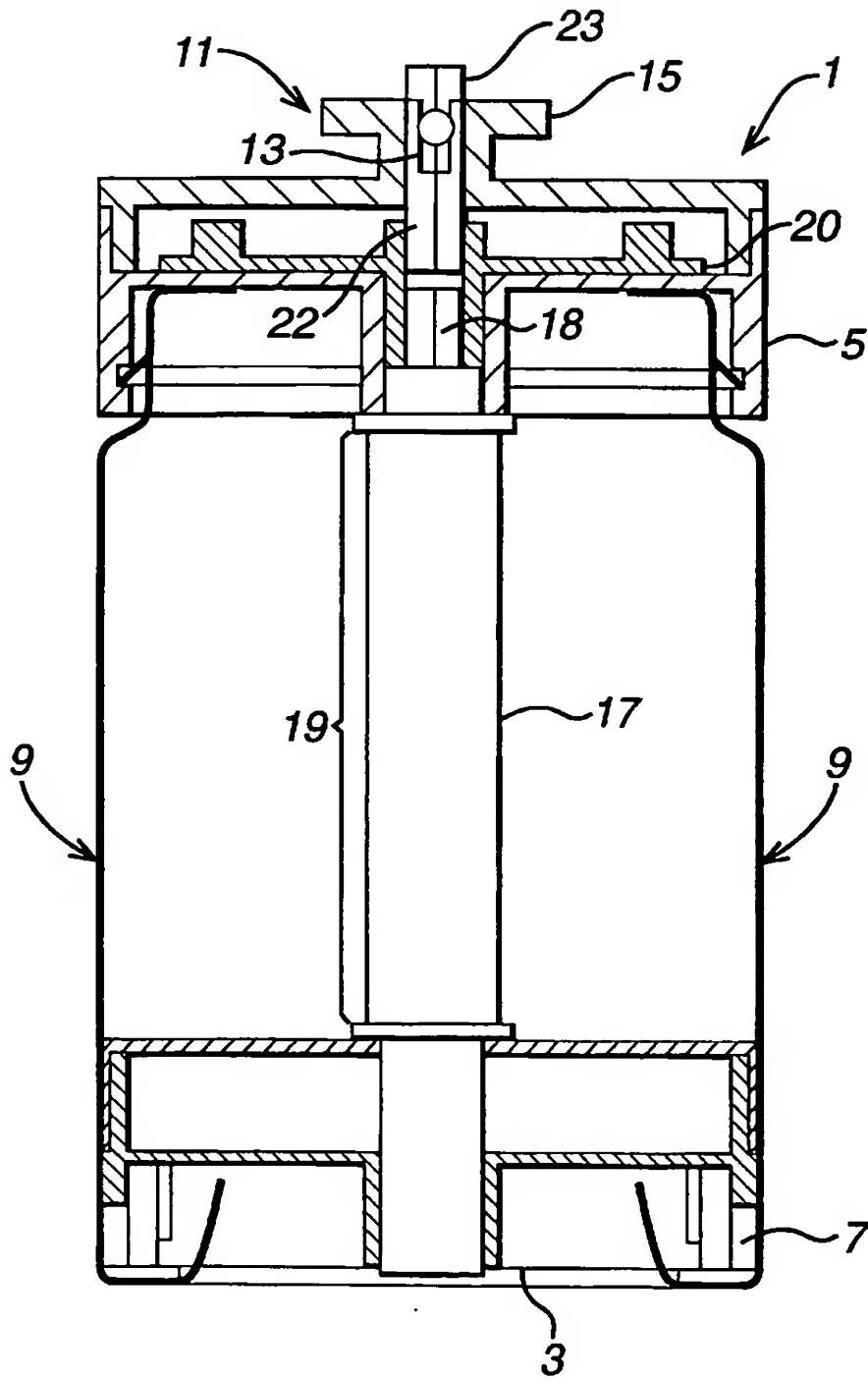


FIG. 3a

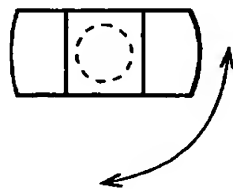
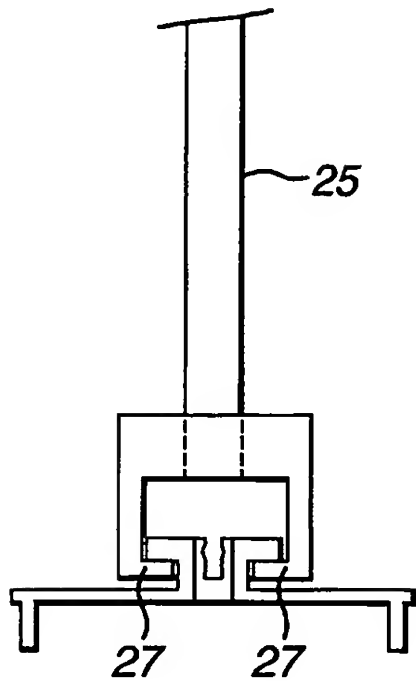
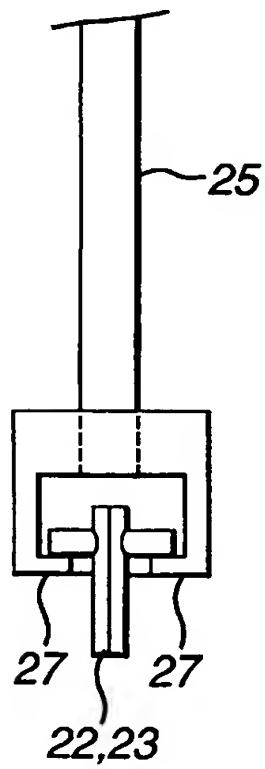


FIG. 3b



CASSETTE FOR QUEUE MANAGEMENT SYSTEM

This invention relates to a cassette for a queue management system and, more particularly, to a method of installing a cassette in a support post of a queue management system.

5

The queue management systems or customer guidance systems of the type to which the present invention relates comprise a plurality of portable support posts between which temporary barriers formed of webbing material are stretched. In particular, the webbing barriers are formed of predetermined lengths of webbing which are stored in cassettes
10 which are normally mounted in the upper end of the support posts and from which the webbing can be withdrawn against the bias of a spring when it is intended to erect the barrier. Normally, the posts are placed at approximately 2 metre intervals and the webbing is then pulled out of the cassette against the spring bias and attached to a suitable fitting on the adjacent post. When several such lengths of webbing are stretched between adjacent
15 pairs of posts, a customer guidance or queue management system is provided and the barriers, depending upon their orientation, can be used to guide or manage the people in a queue by directing them in a required direction.

Such a queue management system can easily be dismantled by disconnecting the pulled out
20 end of the webbing from the adjacent post and allowing it to be withdrawn back into the cassette under the action of the spring within the cassette. One such cassette which we manufacture has a cylindrical body in one end of which a steel spring, known as a TENSATOR spring is located, this spring being wound into a coil and an outer end of the coil being connected to a fitting on the interior of the casing, and the inner end of the coil
25 being connected to a spindle around which the webbing is wound in the opposite sense to the sense of winding of the spring. The outer end of the webbing passes through a slit in the side wall of the casing and is terminated in an end fitting. When the end fitting is pulled out of the casing, this will have the effect of winding the coil spring upon itself and the nature of the spring is such that, during this winding operation, it causes a constant reaction
30 force to be applied to the spindle so that as the webbing is withdrawn from the casing, it is withdrawn against a constant reaction force provided by the spring. Such a cassette will hereinafter be referred to as a cassette of a retractable webbing system.

Normally, these cassettes with their retractable webbing are located in a suitably formed upper end portion of the post and, when withdrawn from the cassette, provide a single barrier stretching from the top of one post to the top of an adjacent post.

5 We have now found that there is a requirement for queue management systems incorporating at least two vertically spaced lengths of webbing. To meet this requirement, it is necessary not only to place a cassette within the upper end portion of the post, but also to locate a cassette, or more than one cassette, within the post but spaced from the top thereof. It is not possible to locate existing cassettes with their withdrawable webbing
10 within the post spaced some distance from its upper end because existing cassettes are manufactured in such a way that the projecting end portion of the webbing has an end fitting thereon for connection to an adjacent post and the spindle upon which the webbing is wound is preloaded so that any withdrawal of the web from the cassette will be resisted by the spring within the cassette. Obviously, the fitting on the end portion of the webbing
15 prevents the free end portion of the webbing being withdrawn into the cassette by the bias of the spring. By the same token, however, the presence of the fitting prevents the cassette from being located within the post at some distance from its upper end unless the post is provided with a slit in its periphery extending from the upper end down to the depth at which the cassette is to be fitted. This is undesirable since it considerably weakens the
20 post. In any event, of course, it is important that the cassette is firmly anchored within the post since there will be a substantial internal torque applied to the post as the webbing is withdrawn against the bias provided by the spring. A slot extending down into the post from its top end would thus be totally unacceptable as the post would not have sufficient rigidity to resist such torsion forces.

25

There is therefore a demand for a cassette of a retractable webbing system of a different design which can easily be fitted into a post of a queue management system but which does not have its webbing subjected to the retraction forces of the TENSATOR spring within the cassette until after it has been loaded within the post and been set up ready for use.

30

The present invention seeks to provide such a cassette of a retractable webbing system, and to provide a method of fitting such a cassette into a post at a location spaced from the top of the post.

According to the present invention, we provide a cassette for use in a queue management system, and for insertion within a post of such a system at a location spaced from an upper end thereof, the cassette having a top end wall, a bottom and a central spindle rotatable, in use, relative to the top end wall and bottom, a length of webbing wound around the spindle, and having an internal end thereof attached to the spindle, a spring biasing said spindle for rotation in a direction which will resist, in use, unwinding of the webbing from the spindle when tension is applied to the outer end of the webbing, a cage arrangement holding apart said top end wall and bottom and through which the outer end of the webbing may be pulled, means on the cassette for engagement with an inner wall of a hollow post to prevent relative rotation between the cassette and post when the cassette is located within the post, and releasable locking means for preventing rotation of the spindle, whereby the cassette can be located within the post, and aligned with an aperture in the post without the spindle rotating under the bias of the spring, thereby permitting the outer end of the webbing to be pulled through the aperture, and then have an end fitting which will not fit through the aperture in the post secured thereto, prior to releasing the locking means. When the locking means is released, this will permit the spring which provides the biasing force on the spindle (to resist withdrawal of the webbing from the cassette) to cause a retraction force on the spindle to wind any webbing pulled out of the cassette back onto the spindle.

Preferably, the bottom of the cassette comprises a generally cylindrical housing in which a coiled spring is located, an outer end of the spring being secured to a fitting on the inside of the housing and an internal end of the spring being secured to a bottom end portion of the spindle. The top end wall of the cassette may comprise an open bottom cylindrical housing in which a braking mechanism is located, the braking mechanism slowing down the speed of retraction of the webbing into the cassette.

Preferably, the releasable locking means comprises a spindle extension connected to the spindle for rotation therewith, and having means thereon for temporary engagement with the top end wall. Preferably, the cassette has a braking mechanism which includes a brake rotor having a central aperture therein with which an upper end of the spindle and a lower end of the spindle extension are keyed. Preferably, the central aperture is of hexagonal cross-section, and the spindle extension is also of hexagonal cross-section. Preferably, the

spindle extension is removable and said means is a transverse locking pin extending through an upper end of the spindle extension which upstands from the top end wall of the cassette, the locking pin sitting within a transverse groove or diametrically located channel formed in an upstanding projection on an outer face of the top end wall.

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Preferably, the transverse locking pin projects radially outwardly beyond the upstanding projection so that, when the cassette has been loaded within a support post and it is desired to release the locking pin, a tool extending down into the post through the top end thereof may be twisted to engage the radially projecting ends of the locking pin and lift the locking
 10 pin so as to release the locking pin from the transverse groove (by applying a lifting force to the locking pin parallel to the longitudinal axis of the spindle). Once so released, the spindle can rotate under the bias of its spring, thus withdrawing any loose webbing into the cassette until the fitting on the end thereof prevents any further rotation of the spindle. Once the locking means has been released, the spindle extension can be pulled out of the
 15 hexagonal aperture in the brake rotor and withdrawn from within the post by the tool.

The present invention also relates to a method of fitting a cassette within a hollow post of a queue management system, the cassette being of the construction described above and the method comprising the steps of lowering the cassette into the post to a depth sufficient to
 20 align the webbing wound on the spindle with an aperture in the post, ensuring that the cassette cannot rotate within the post relative to the post, withdrawing the outer end portion of the webbing through the aperture in the post, securing an end fitting which will not fit through the aperture onto the outer end of the webbing, and then releasing the releasable locking means by applying a force to the transverse locking pin so as to pull the locking pin
 25 from within the confines of the transverse groove on the upstanding projection on the top end wall of the cassette, whereby the webbing of the cassette will be subjected to the force of the spring, thereby applying a retraction force to the webbing, tending to resist withdrawal of the webbing from the cassette through the aperture in the post.

30 Preferably, the locking pin is released from the transverse groove by means of a location tool used to lower the cassette into the post, the location tool having jaws on its lower end which can engage a pair of radially outwardly extending flanges on the upstanding projection and extending at right-angles to the longitudinal direction of the groove in which

the locking pin is located and by subsequently rotating the location tool through 90° about its longitudinal axis so as to release the jaws from the radially outwardly projecting flanges and engage the jaws beneath projecting end portions of the locking pin, whereupon the locking pin can be pulled from out of the confines of the transverse groove by applying a
5 tension force to the location tool.

The present invention is now described by way of example with reference to the accompanying drawings in which:

10 FIGURE 1 is a perspective view of a cassette according to the invention with the bottom end of a location tool suspended above the cassette;

FIGURE 2 is a partly schematic side elevation with parts omitted for the sake of clarity of the cassette shown in Figure 1; and

15

FIGURES 3a and 3b are scrap views showing the location tool engaging respectively with the cassette, and with a transverse locking pin.

Referring to the drawings, the cassette shown therein has a top end wall 1 and a bottom 3,
20 the top end wall forming part of an upper cylindrical housing 5 which is open at its lower end, and the bottom 3 being part of a lower generally cylindrical housing 7 which is open at its upper end. The two housings are maintained in vertically spaced relationship by means of a pair of straps 9 which are secured to the respective housings 5 and 7, as shown in Figure 2.

25

The top end wall 1 has a centrally located aperture therein. Surrounding the aperture is an upstanding projection 11 having a transverse groove 13 in the upper face thereof and, extending from an upper region thereof at right angles to the longitudinal axis of the groove, a pair of radially extending flanges 15.

30

As can be seen from the drawings, the lower face of each flange 15 is spaced from the top surface of the top end wall 1.

Located within the cassette and extending centrally thereof is a spindle shown schematically at 17, around a central region 19 of which a length of webbing is wound, the internal end of the webbing being secured in known manner to the spindle 17 and the outer end of which is shown at 21 in Figure 1. The lower end of the spindle 17 is rotatably mounted in known manner in the housing 7 and has the inner end of a coiled spring (not shown) secured thereto, the opposite end of the coiled spring being secured in known manner to an internal fixture within the housing 7. The coiled spring is of known construction, one such spring being known as a TENSATOR spring. At its upper end, the spindle 17 is rotatably supported within an internal bearing in known manner within the housing 5. At its upper end 18, the spindle 17 is hexagonal and this hexagonal portion is keyed to a brake rotor 20 in known manner. This brake rotor 20 has a hexagonal central aperture therein which is not only engaged by spindle end 18, but also by a removable spindle extension 22 which projects outwardly through an aperture in the top end wall 1 of the cassette. Because the spindle extension 22 is of hexagonal cross-section, it is keyed to the upper end 18 of the spindle 17 by the rotor 20 so as to be incapable of rotating relative thereto, but it is capable of axial sliding movement relative thereto. A transverse locking pin 23 passes through the upper end of the spindle extension 22 and this pin 23 sits in the transverse groove 13, formed in the upstanding projection 11. From the foregoing, it will be appreciated that it is possible to wind the webbing, the outer end of which is shown at 21, loosely around the spindle 17 and, at the same time, wind the coiled spring around the lower end of the spindle 17 in such a manner as to provide a rotational biasing force on the spindle 17 from the spring, but then to prevent this biasing force causing rotation of the spindle 17 by locating the transverse locking pin 23 within the transverse groove 13 in the top of the top end wall 1.

25

The pre-loaded cassette with its webbing wound thereon can then be lowered into a hollow post of a queue management system by using a special tool 25 having a pair of cassette supporting jaws such as those shown at 27 in Figure 1. Ideally, the tool 25 should be in the form of a rod with a handle (not shown) at its upper end and an adjustable stop (not shown) intermediate its ends, which is used to prevent the cassette supported by the jaws 27 from being lowered down into the hollow post beyond the apertures in the side wall of the post through which the webbing is to be withdrawn. Obviously, the position of the stop on the tool should first be adjusted to the depth of the apertures so that, when the underside of the

stop abuts the upper periphery of the tube, the cassette supported by the tool will be opposite the apertures and it will then be possible for the operator to rest the tool on the tube and "fish out" the end 21 of the webbing through the appropriate aperture and securely fit to the end of the webbing an end fitting which will be larger than the aperture in the side wall of the tube. Once the end fitting has been fitted, the spring for applying a constant torsional force to the spindle of the cassette can then be activated. This is achieved by twisting the tool through 90° so as to move the jaws 27 out of contact with the two radial flanges 15 and instead to move under the projecting ends of the transverse locking pin 23. Because the interior of the tube is fitted with splines which engage with appropriate splines or ribs on the cassette (not shown), to prevent relative rotation between the cassette and the tube, this will be relatively easy. Once the jaws 27 are located beneath the ends of the pin 23, a sharp upward force can be applied to the tool to move the pin vertically upwards so that it is no longer confined by the transverse groove 13. This upward movement will be possible due to the permissible relative vertical movement between the spindle extension 22 and the upper end 18 of the spindle 17, and as soon as the pin 23 is no longer restricted from rotation by the spring acting on the spindle, the spring will cause rotation of the spindle thus taking up any slack in the webbing. However, withdrawal of the webbing totally to within the tube will be resisted by the presence of the end fitting on the free end 17 of the webbing. The cassette is now ready for use and any withdrawal of the webbing from the tube will be against the spring bias provided by the spring acting on the spindle 17, just as would occur with a traditional cassette, which can then be fitted in the upper end portion of the tube, once the tool has been removed therefrom.

Of course, once the spring loading on the spindle 17 has been activated, the spindle extension 22 can be lifted out of the post by withdrawing the tool completely from the post; a further cassette of traditional construction can then be fitted into the top of the post.

It will of course be understood that the present invention has been described above purely by way of example, and modifications of detail can be made within the scope of the invention.

CLAIMS

1. A cassette for use in a queue management system, and for insertion within a post of such a system at a location spaced from an upper end thereof, the cassette having a top end wall, a bottom and a central spindle rotatable, in use, relative to the top end wall and bottom, a length of webbing wound around the spindle, and having an internal end thereof attached to the spindle, a spring biasing said spindle for rotation in a direction which will resist, in use, unwinding of the webbing from the spindle when tension is applied to the outer end of the webbing, a cage arrangement holding apart said top end wall and bottom and through which the outer end of the webbing may be pulled, means on the cassette for engagement with an inner wall of a hollow post to prevent relative rotation between the cassette and post when the cassette is located within the post, and releasable locking means for preventing rotation of the spindle, whereby the cassette can be located within the post, and aligned with an aperture in the post without the spindle rotating under the bias of the spring, thereby permitting the outer end of the webbing to be pulled through the aperture, and then have an end fitting which will not fit through the aperture in the post secured thereto, prior to releasing the locking means.
2. A cassette as claimed in claim 1, wherein the bottom of the cassette comprises a generally cylindrical housing in which a coiled spring is located, an outer end of the spring being secured to a fitting on the inside of the housing and an internal end of the spring being secured to a bottom end portion of the spindle.
3. A cassette as claimed in claim 1 or 2, wherein the top end wall of the cassette comprises an open bottom cylindrical housing in which a breaking mechanism is located, the breaking mechanism slowing down the speed of retraction of the webbing into the cassette.
4. A cassette as claimed in claim 1, 2 or 3, wherein the releasable locking means comprises a spindle extension connected to the spindle for rotation therewith and having means thereon for temporary engagement with the top end wall.

5. A cassette as claimed in claim 4, which incorporates a braking mechanism including a brake rotor having a central aperture thereon with which an upper end of the spindle and a lower end of the spindle extension are keyed.

5 6. A cassette as claimed in claim 4 or 5 wherein said means is a transverse locking pin extending through an upper end of the spindle extension which upstands from the top end wall of the cassette, the locking pin sitting within a transverse groove or diametrically located channel formed in an upstanding projection on an outer face of the top end wall.

10 7. A cassette as claimed in claim 6, wherein the transverse locking pin projects radially outwardly beyond the upstanding projection so that, when the cassette has been loaded within a support post and it is desired to release the locking pin, a tool extending down into the post through the top end thereof may be twisted to engage the radially projecting ends of the locking pin and lift the locking pin so as to release the locking pin from the
15 transverse groove.

8. A cassette, substantially as hereinbefore described with reference to the accompanying drawings.

20 9. A method of fitting a cassette within a hollow post of a queue management system, the cassette being of the construction claimed in claim 1 and the method comprising the steps of lowering the cassette into the post to a depth sufficient to align the webbing wound on the spindle with an aperture in the post, ensuring that the cassette cannot rotate within the post relative to the post, withdrawing the outer end portion of the webbing through the
25 aperture in the post, securing an end fitting which will not fit through the aperture onto the outer end of the webbing, and then releasing the releasable locking means by applying a force to the transverse locking pin so as to pull the locking pin from within the confines of the transverse groove on the upstanding projection on the top end wall of the cassette, whereby the webbing of the cassette will be subjected to the force of the spring, thereby
30 applying a retraction force to the webbing, tending to resist withdrawal of the webbing from the cassette through the aperture in the post.

10. A method as claimed in claim 9, wherein the locking pin is released from the transverse groove by means of a location tool used to lower the cassette into the post, the location tool having jaws on its lower end which can engage a pair of radially outwardly extending flanges on the upstanding projection and extending at right-angles to the longitudinal direction of the groove in which the locking pin is located and by subsequently
5 rotating the location tool through 90° about its longitudinal axis so as to release the jaws from the radially outwardly projecting flanges and engage the jaws beneath projecting end portions of the locking pin, whereupon the locking pin can be pulled from out of the confines of the transverse groove by applying a tension force to the location tool.

10

11. A method of fitting a cassette within a hollow post of a queue management system as claimed in claim 9 and substantially as hereinbefore described with reference to the accompanying drawings.



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Claims searched: All

Examiner: Geoff Nicholls
Date of search: 10 May 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): B8M (MB2 MB7)

Int Cl (Ed.6): B65H 75/38 75/40 75/44 75/48 E01F 13/02

Other: ONLINE:WPI,EPODOC,JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	EP 0287510 A1 (DONNET)	
A	US 4844420 (OSTER)	

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